

**AMENDMENTS TO THE CLAIMS:**

Rejected claims 15, 18, and 19 are canceled without disclaimer or prejudice, to permit remaining claims to pass to immediate allowance.

I. (Previously presented) A method to at least one of reduce a memory space requirement and to increase a processing efficiency in a computerized method of linear algebra processing, said method comprising:

providing a hybrid full-packed data structure for processing data of a triangular matrix by one or more dense linear algebra (DLA) matrix subroutines designed to process matrix data in a full format, as modified to process matrix data using said hybrid full-packed data structure; and

converting said data from said triangular matrix into said hybrid full-packed data structure, as follows:

determining a portion of said triangular matrix data that would comprise a square portion having a dimension approximately one half a dimension of said triangular matrix data;

fitting a first triangular portion of said triangular matrix data into a first location relative to data of said square portion; and

fitting a second triangular portion of said triangular matrix data into a second location relative to data of said square portion,

wherein said first triangular portion, said second triangular portion, and said square portion fit together to form said rectangular data structure,

wherein said hybrid full-packed data structure provides a rectangular full format data structure for an entirety of said triangular matrix data and said triangular matrix comprises a triangular or symmetric/Hermitian matrix.

2-3. (Canceled)

4. (Previously presented) The method of claim 1, wherein said matrix subroutine designed to process matrix data in said full format comprises a matrix subroutine of a LAPACK (Linear Algebra PACKage) software package.

5. (Previously presented) The method of claim 4, wherein said matrix subroutine comprises a variant of a corresponding full format routine of a level 3 BLAS (Basic Linear Algebra Subroutine).

6. (Original) The method of claim 5, wherein said level 3 BLAS comprises an L1 kernel routine, wherein L1 comprises an L1 cache in a computer, said L1 cache comprising a cache closest to one of a CPU (Central Processing Unit) and an FPU (Floating-Point Processing Unit) in said computer.

7-9. (Canceled)

10. (Previously presented) An apparatus for linear algebra processing, as configured to reformat data for said linear algebra processing as described below to at least one of reduce a memory space requirement and to increase a processing efficiency in said linear algebra processing, said apparatus comprising:

a processor for processing a matrix data of a triangular matrix in at least one dense linear algebra (DLA) matrix subroutine designed to process matrix data in a full format, using a hybrid

full-packed data structure, said DLA matrix subroutine having been modified to process matrix data using said hybrid full-packed data structure; and

a receiver for receiving said triangular matrix data, said processor further converting said triangular matrix data into said hybrid full-packed data structure,

wherein said hybrid full-packed data structure comprises:

a square portion of said triangular matrix data;

a first triangular portion of said triangular matrix data; and

a second triangular portion of said triangular matrix data,

wherein said square portion, said first triangular portion, and said second triangular portion are fitted together to form said rectangular data structure, and

wherein said hybrid full-packed data structure provides a rectangular data structure for an entirety of said triangular matrix data and said triangular matrix comprises a triangular or symmetric/Hermitian matrix.

11-12. (Canceled)

13. (Previously presented) The apparatus of claim 10, wherein said at least one matrix subroutine designed to process matrix data in a full format comprises at least one level 3 BLAS (Basic Linear Algebra Subroutine) or a matrix subroutine of a LAPACK (Linear Algebra PACKage) or a comparable software package.

14. (Original) The apparatus of claim 13, wherein said processor comprises one of a CPU (Central Processing Unit) and an FPU (Floating-Point Processing Unit), said apparatus further comprising:

an L1 cache, said L1 cache comprising a cache closest to said CPU or said FPU,  
wherein said level 3 BLAS comprises an L1 kernel routine.

15-25. (Canceled)

26. (Previously presented) The method of claim 1, wherein said triangular matrix data comprises matrix data in a triangular packed format, said hybrid full-packed data structure thereby allowing a faster processing using a modified full format DLA matrix subroutine than is possible using a packed format DLA matrix subroutine.

27. (Previously presented) The method of claim 1, wherein said triangular matrix data comprises matrix data in a triangular full format, said hybrid full-packed data structure thereby allowing a reduction in required memory space by about 100% compared to said triangular full format data.

28. (Previously presented) The method of claim 26, said hybrid full-packed data structure thereby providing a means to eliminate a necessity that processing triangular matrix data in a packed format must be executed by slower DLA subroutines designed for said packed format.